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THE PREVALENCE AND RISK FACTORS FOR ANTENATAL DEPRESSION AMONG PREGNANT WOMEN ATTENDING CLINICS IN RIYADH, SAUDI ARABIA

Haifa Alotaibe[1*], Tarek Elsaid[2] and Rabaa Almomen[3]

[1]Senior registrar of Family Medicine, Family Medicine Department, Prince Sultan Military Medical City, Riyadh, KSA.

[2,3]Consultant of Family Medicine, Family Medicine Department, Prince Sultan Military Medical City, Riyadh, KSA.

***Corresponding Author: Haifa Alotaibe**

Senior Registrar of Family Medicine, Family Medicine Department, Prince Sultan Military Medical City, Riyadh, KSA.

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ABSTRACT

Objective: This study was aimed to assess antenatal depression prevalence among pregnant women in Prince Sultan Military Medical City, Riyadh. **Method:** A cross-sectional study was conducted at antenatal clinics in Prince Sultan Military Medical City, Riyadh, Saudi Arabia. Participants were recruited during their first, second, and third trimester and completed the Edinburgh Postnatal Depression Scale. Participants included women aged 18–45, understood Arabic, had no documented obstetrical complications, and visited a clinic anytime between January 3 and February 20, 2014. **Results:** Results revealed an antenatal depression prevalence rate of 54.5%. Prevalence rates were 20.2%, 15%, and 18% during the first, second, and third trimesters, respectively. Rates between the three trimesters were not significantly different from each other. The main risk factors for antenatal depression included employment history, educational background, unintended pregnancy, and lack of partner support (*P*s < 0.05). Multivariate analyses indicated that inadequate emotional support was the only significant predictor of antenatal depression. **Conclusion:** The present findings suggest that antenatal depression may be fairly common, and screening for depression throughout a pregnancy is likely important.

KEYWORDS: antenatal depression, EPDS, prevalence, pregnancy.

1. INTRODUCTION

In contrast to public perceptions, pregnancy is not always a joyful or happy experience; several women endure negative affective experiences during their pregnancy.[1] Peripartum (pregnancy and postpartum) life stages are associated with somatic, hormonal, and social adjustments that can affect a woman's psychological well-being. Specifically, depression can take place anytime during a pregnancy (which is referred to as antenatal depression) and after the delivery (which is known as postpartum depression).[1] Symptoms of antenatal and postpartum depression are quite similar to general depression: gloomy mood, lack of interest in things, cannot enjoy activities, unable to concentrate, and poor self-esteem.[1] The birth of a child can often lead to changes, not only psychological and hormonal,[2] but also social and financial, especially in cultures where women contribute to the family income and pursue diverse professional and social interests.[3]

Research suggests that the peripartum stage of a woman's life has the highest risk of facilitating psychological turbulence.[3] Some studies argue that gestational depression is more common in developed countries, as this phenomenon may be less common due to social practices and cultural habits in developing countries. A systematic review of 19 studies assessed depression prevalence during pregnancy and postpartum phases. Fifteen of these studies were conducted in developed countries, with the remainder conducted in developing countries.[4] Prevalence for gestational and postpartum depression among developing countries was 28.4% and 23.1%, respectively. This is in contrast to rates of 13% and 9.6% in developed countries.[2,4,5] Thus, as per previous observations, antenatal depression tends to be greater in developing countries.[4] Another systematic review of 17 studies revealed a weighted mean antenatal depression prevalence (in 7 low-to-middle income countries) of 15.6%.[2] Yount and Smith estimated high rates of postpartum depression among Arab Middle Eastern women, ranging from 13 to 53%.[6] Such rates tend to be higher when compared to rates in Western countries.[6] In Jordan, a prevalence of 19% has been reported,[7] exceeding rates observed in developed countries, including England, Japan, and Hong Kong.[8,9,10] However, this prevalence rate is commensurate with other Middle Eastern countries, such as Morocco, Lebanon, and the United Arab Emirates,[11,12] as well as other developing countries including Thailand, Pakistan, and Nigeria.[13,14,15]

Antenatal depression is quite difficult to identify, as it shares symptoms related to somatic problems, such as

fatigue and loss of appetite, and somatic problems occur throughout a pregnancy.[1] Several methods have been used to predict the development of antenatal depression, including the Edinburgh Postnatal Depressive Symptoms Scale (EPDS) and other questionnaires. The EPDS is an effective method for evaluating antenatal depression and is commonly used for preventive public health interventions.[1] The cutoff score used to detect antenatal depression prevalence varies, with the most common cutoff being 13 or higher.[7] EPDS validation studies have been performed with thresholds of 13–14 and 14 or above.[7,16] EPDS interviews are usually followed by a questionnaire that assesses social, economic, and demographic profiles, as well as marital status, pregnancy stage, stressful life events, past pregnancies, pregnancy intention and planning, psychological disorders, financial and social support, domestic violence, alcohol intake, and cigarette use.[1] Sociodemographic characteristics include age, educational level, and income.[5,17] The most commonly used supplemental questionnaires include the Self-Report Questionnaire (SRQ-20), Depression Anxiety Stress Scale (DASS), Cambridge Worry Scale (CWS), and Maternity Social Support Scale (MSSS).

In addition to being a common issue during pregnancy, antenatal depression is considered a major risk factor for postnatal depression. Several cohort studies have shown that gestational depression is the greatest risk factor for postpartum depression.[17,18] One systematic review revealed that 41.5% of postpartum depression cases emerged during pregnancy, suggesting that recognizing depressive episodes during early pregnancy stages is important and beneficial.[17,18,19]

Despite the fact that postpartum depression is extensively linked to adverse mother and child outcomes, a recent meta-analysis suggests that women with depression during pregnancy are at increased risk for a preterm birth (PTB) and low birth weight (LBW) babies.[2,20,21,22,23,24] Previous evidence has revealed that antenatal depression is also linked with still birth, recurrent abortions, stunted growth during early childhood, poor mother-infant bonding,[21,25] and poor child mental and cognitive behavioural development.[20,21,23,26,27]

Very few published studies have examined antenatal depression in Saudi Arabia. Thus, antenatal depression prevalence among Saudi women has not been adequately addressed. Detecting women in need of intervention is necessary for protecting maternal and family psychosocial well-being within this population.

The goal of the present study was to determine antenatal depression rates at a Saudi Arabian primary health care and antenatal setting. Depression prevalence during the first, second, and third trimester was also examined. Finally, risk factors for antenatal depression were assessed.

2. METHODS

2.1. Study design and sample

A cross-sectional observational design was used. The sample consisted of 420 pregnant woman, which was calculated based on antenatal depression prevalence within low, middle, and high income countries (ranging between 10–24%, assuming a non-response rate of 10%, with a precision around ± 2.5 and a 95% confidence interval) who received care at antenatal clinics within Prince Sultan Military Medical City (i.e., wives and family members of military officers and soldiers). The following equation was used to determine the sample size,

$$n = \left[\frac{z_{\alpha/2}\sigma}{E}\right]^2$$

Where n is the sample size, $z_{\alpha/2}$ is the standard variate value for a specific confidence level, σ is the population standard deviation, and E is the estimated margin of error.

2.2. Inclusion and exclusion criteria

The following inclusion criteria were established: **w**omen aged 18 to 45 years old, no known obstetrical complications, able to provide informed consent, and could understand Arabic. Women with any known psychiatric conditions, on any antidepressant or antipsychotic medications, or a history of postpartum depression were excluded. Non-probability quota sampling was used to obtain a proportional quota sample of 420 women across the three trimesters.

2.3. Study tools

The study materials consisted of two parts. The first consisted of sociodemographic data and risk factors associated with antenatal depression. Specifically, demographic details, number of children, intended pregnancy, planned pregnancy, partner support, and social support were assessed. Face and content validity were conducted via a panel of experts in family medicine. These instruments were also piloted with a small sample of childbearing Saudi women. Results showed that the measures were reliable and valid. The second assessment consisted of the Edinburgh Postnatal Depression Scale (EPDS), a 10-item questionnaire with scores ranging from 0 to 3 that evaluates any depressed mood experienced over the past week.[1,16] Items from the EPDS include those that probe depressed mood, sleep disturbances, lack of interest in activities, suicidal thoughts, and feelings of guilt.[1]

The EPDS has been widely used in antenatal and postnatal depression research. This tool is reliable, valid, and has been tested on diverse populations.[1,2,6] The Arabic-EPDS version was translated and back translated. We also evaluated information from four published validation studies comparing the Arabic-EPDS with

other standard measures of depression/anxiety.[28] Three of the validation studies were conducted during the postpartum period and one during both the antenatal and postpartum period.[28,29] The cutoff score used to detect antenatal depression prevalence varies, with the most common score being 13 or higher.[7] In the present study, women scoring above or equal to 13 where labelled as depressed and those who scored below 13 as non-depressed. Ethical approval of the study was obtained from Prince Sultan Military Medical City research Centre. The study was conducted from January 3 to February 20, 2014. Interviewers recruited 460 women, 10 of whom refused to participate, 15 who had obstetrical complications, and 15 with a previous history of depression. Women who fit the sample criteria and were willing to participate (n = 420) continued with the interview. The interview was conducted by a researcher and three trained interviewers (the interviewers were Saudi nurses trained by the researcher) in a private, quite room, away from the obstetric clinic, and without the husband present.

2.4. Statistical analysis

Analyses were carried out using the Statistical Package for the Social Sciences (SPSS) version 11.5 (2000). Frequencies, means, and standard deviations were calculated as appropriate on the demographic variables. Chi-square tests and univariate and multivariate logistic regressions were performed to predict risk factors for antenatal depression. An alpha level of 0.05 was used for all tests to indicate statistical significance or to continue after an extract.

3. RESULTS

3.1. Sociodemographic characteristics

Sociodemographic information from the 420 participants is shown in Table 1. There were an equal number of women in their first, second, and third trimester. The majority of participants were aged 20 to 35 years old (75.7%). While nearly all women were in a monogamous marriage, 6.2% were in a polygamous marriage. More than half of the participants were housewives, and roughly a quarter were expecting their first child. Only 24.5% of the participants were employed. Nevertheless, more than half of the participants received a monthly income of 5,000 to 10,000 SR. In terms of education, 48.3% had completed a university degree.

Table 1: Sociodemographic data from the study participants.

Sociodemographic Factor		N	%
Age group	< 20	13	**3.1**
	20–35	318	**75.7**
	35 or more	89	**21.2**
Marital status	Married (monogamous)	394	**93.8**
	Married (polygamous)	26	**6.2**
	Widowed	0	**0**
	Divorced	0	**0**
Number of children	None	113	**26.9**
	1–3	232	**55.2**
	4 or more	75	**17.9**
Occupation	Student	45	**10.7**
	Employed	103	**24.5**
	Housewife	272	**64.8**
Educational level	Primary	20	**4.8**
	Intermediate	49	**11.7**
	Secondary	148	**35.2**
	University	203	**48.3**
Residency	Nuclear family	359	**85.5**
	Extended family	61	**14.5**
Monthly income (in SAR)	< 5,000	48	**11.4**
	5,000 < 10,000	231	**55.0**
	10,000 < 15,000	78	**18.6**
	> 15,000	63	**15.0**
Trimester	First	140	**33.3**
	Second	140	**33.3**
	Third	140	**33.3**

3.2. Edinburgh Postpartum Depression Scale (EPDS)

Table 2 shows that the majority of participants had an EPDS score above or equal to 13, suggesting a high probability of antenatal depression. The highest antenatal depression prevalence was observed during the first trimester (20.22%; see Table 3). However, differences in prevalence rates between each trimester were not statistically significant ($P > 0.05$).

Table 2: Antenatal depression prevalence.

EPDS	N	%
< 13	191	**45.5**
≥ 13	229	**54.5**
Total	420	**100**

Table 3: Antenatal depression across trimester (n = 420).

Trimester	No	Depression in two groups				Total	
		Yes (229)		No (191)		*P* value	
		EPDS ≥ 13	%	EPDS < 13	%		
First	**140**	85	**20.22**	55	**13.1**	**33.32**	**0.096**
Second	**140**	67	**15.95**	73	**17.4**	**33.35**	
Third	**140**	77	**18.33**	63	**15**	**33.33**	
Total	**420**	229	**54.50**	191	**45.5**	**100%**	

3.3. Risk factors for antenatal depression

Several sociodemographic characteristics and other factors were observed as risks for antenatal depression, as shown in Tables 4 and 5. These variables were first assessed via a univariate analysis. Each category includes one 'reference' group having the lowest antenatal depression prevalence. Odds ratios (OR) were determined by comparing antenatal depression odds in a particular group with the reference group. Findings revealed that pregnant women who were employed were almost two times more likely to experience antenatal depression (OR 1.91, $P < 0.05$). A higher education level was also considered a significant risk factor for antenatal depression (OR 2.90, $P < 0.05$). However, insufficient support from a partner was the main risk factor for antenatal depression, with insufficient emotional support making women 5.9 times more likely to experience antenatal depression ($P < 0.05$). Having an unintended pregnancy and relying on in-laws for childcare were also associated with an increased risk for antenatal depression. Interestingly, having an unplanned pregnancy and any level of monthly income were negligible factors ($P > 0.1$). We defined unintended pregnancy as an unplanned pregnancy in which the expecting mother was unwilling to go through the maternity period.

Multivariate analyses were performed on variables from the univariate analyses that had *P*-values ≤ 0.1. These variables included occupation, educational level, intended pregnancy, support from a partner, and family support (Table 6). Results showed that the most predictive variable for antenatal depression was lack of emotional support from a partner. This suggests that adequate emotional partner support is quite important for mitigating antenatal depression prevalence.

Table 4: Univariate analyses of sociodemographic risk factors.

Characteristic		N	AD (%)	OR (CI)	*p* value
Age group	< 20	6	53.8	1	Ref
	20–35	222	30.2	2.70 (0.79–9.34)	0.071
	> 35	61	31.5	2.54 (0.68–9.58)	0.103
Marital status	Married (polygamous)	19	26.9	1.25 (0.48–3.36)	0.628
	Married (monogamous)	270	31.5		
Number of children	0	74	34.5	1	Ref
	1–3	163	29.7	1.25 (0.75–2.07)	0.370
	4 or more	52	30.7	1.19 (0.61–2.34)	0.583
Occupation	Housewife	179	34.2	1	Ref
	Student	29	35.6	0.94 (0.47–1.92)	0.858
	Employed	81	21.4	1.91 (1.09–3.38)	0.016*
Education level	University	151	25.6	2.90 (1.14–7.37)	0.025*
	Secondary	93	37.2	1.69 (0.66–4.32)	0.272
	Intermediate	35	28.6	2.50 (0.85–7.31)	0.094
	Primary	10	50.0	1	Ref
Residency	With family	46	24.6	1.46 (0.76–2.87)	0.229
	Alone	243	32.3		
Monthly income	> 15,000 SAR	46	27.0	0.80 (0.34–1.93)	0.625
	10,000–15,000 SAR	54	30.8	0.67 (0.29–1.53)	0.341
	5,000–10,000 SAR	152	34.2	0.57 (0.28–1.18)	0.132
	< 5,000 SAR	37	22.9	1	Ref

AD = antenatal depression; * = statistically significant

Table 5: Univariate analyses with additional participant characteristic risk factors.

Characteristic		N	AD (%)	OR (CI)	*p* value
ANC visit	No	9	40.0	0.67 (0.21–2.17)	0.453
	Yes	280	30.9		
Regularly visiting ANC (405)	No	30	18.9	2.02 (0.82–5.22)	0.099
	Yes	250	32.1		
Intended pregnancy	No	66	19.5	2.13 (1.14–4.02)	0.011*
	Yes	223	34.0		
Planned pregnancy	No	173	30.0	1.15 (0.74–1.78)	0.515
	Yes	116	32.9		
Emotional Support from partner	Very Sufficient	67	48.5	1	Ref
	Sufficient	126	30.0	2.19 (1.34–3.61)	0.001*
	Sometimes	88	13.7	5.91 (2.92–12.11)	0.000*
	Never	8	0.0	-	0.006*
Financial support from partner	Very Sufficient	80	39.8	1	Ref
	Sufficient	124	34.4	1.26 (0.78–2.05)	0.317
	Sometimes	77	13.5	4.25 (2.01–9.12)	0.000*
	Never	8	11.1	5.30 (0.64–116.23)	0.081
Do you have other support	No	73	27.7	1.24 (0.74–2.10)	0.388
	Yes:	216	32.3		
	My Family	171	30.5	1.36 (0.87–2.15)	0.158
	In-laws	31	44.6	1.96 (1.06–3.61)	0.019*
	Housemaid	20	21.1	0.56 (0.23–1.33)	0.157
	Friends	2	0.0	0.00 (0.00–9.01)	1.000

AD = antenatal depression; * = statistically significant

Table 6 Multivariate analyses of risk factors for antenatal depression

Characteristic		OR (CI)	Adjusted OR (CI)	*P* value
Occupation	Housewife	1	-	ref
	Student	0.94 (0.47–1.92)	1.48 (0.66–3.35)	0.343
	Employed	1.91 (1.09–3.38)	1.48 (0.72–2.92)	0.256
Education level	University	2.90 (1.14–7.37)	2.18 (0.63–7.54)	0.217
	Secondary	1.69 (0.66–4.32)	1.97 (0.59–6.58)	0.272
	Intermediate	2.50 (0.85–7.31)	1.64 (0.41–6.47)	0.483
	Primary	1	-	ref
Intended pregnancy	No	2.13 (1.14–4.02)	0.43 (0.11–1.66)	0.219
	Yes			
Emotional support from partner	Very sufficient	1	-	ref
	Sufficient	2.19 (1.34–3.61)	2.45 (1.29–4.63)	0.612
	Sometimes	5.91 (2.92–12.11)	3.97 (0.16–9.79)	0.003*
	Never	-		
Financial support from partner	Very sufficient	1	-	Ref
	Sufficient	1.26 (0.78–2.05)	0.80 (0.42–1.53)	0.502
	Sometimes	4.25 (2.01–9.12)	1.63 (0.61–4.33)	0.331
	Never	5.30 (0.64–116.23)	1.25 (0.12–12.62)	0.081
Do you receive other support	In-laws	1.96 (1.06–3.61)	0.74 (0.38–1.44)	0.376

AD = antenatal depression; * = statistically significant

4. DISCUSSION

The present cross-sectional study measured antenatal depression prevalence among women attending clinics at PSMMC. Prevalence was measured based on established EPDS cutoff scores. The EPDS is an effective and reliable tool for identifying antenatal depression[28,29] and was easily administered with our study sample.

4.1. Antenatal depression prevalence

Antenatal depression prevalence was measured among 420 women attending the Al-Wazarat Primary Healthcare Centre and Obstetric general clinic. Two hundred and twenty nine participants scored above 13 on the EPDS, indicating an antenatal depression prevalence of 54.5%. This is significantly higher in comparison to a previous study conducted in northern Jordan, the United Arab Emirates, Lebanon, and Morocco, revealing a

prevalence of 19%.[7] This was also higher than a study conducted in Riyadh, Saudi Arabia (44%).[30] The high rate of antenatal depression in the present study might be explained by differences in our data collection methods (i.e., using screening questions rather than a diagnostic interview that includes a full clinical assessment). Additionally, we used a different screening tool from previous studies. For example, Moawed et al.'s study included 316 subjects who were assessed using the Beck Depression Inventory (BDI).[30]

One advantage of early detection via screening methods as opposed to clinical interviews is that screening tools provide an early picture that could help establish early interventions, especially if followed up with a confirmatory diagnosis based on antenatal protocols. Another possible explanation for our higher rates of antenatal depression could be that our sample consisted of family members of military personnel who may have been more exposed to mental health issues.[31] For instance, wives of deployed military personnel may go through a pregnancy without the presence of their husband. Second, wives of military members are more likely to suffer from partner abuse, either obvious physical abuse or subtle emotional abuse.[31] Third, career frustration, due to multiple transportations for their husband's career, could have mental health consequences.[31] Finally, a husband's ability to give quality care might be diminished if a deployed member of the military.[31]

Mohammad et al. revealed a similar finding to the aforementioned studies regarding antenatal depression rates (19%) in several Arabic-speaking countries.[7] This is perhaps due to similar cultural influences for conceptualized depression treatment during pregnancy. In some developing countries, depression rates tend to be lower than what we observed (23.1% on average), as well.[3] Prevalence tends to be even lower in most developed countries, including Japan (5.6%), Sweden (7.7%), and the United States (9%).[3] This might be the result of high quality antenatal care and fewer excessive stressful life events experienced by women in those countries.[3]

4.2. Depression prevalence during the first, second, and third trimester

Depression rates during the first, second, and third trimester in the present study varied slightly (15% to 20.2%), with the lowest rate during the second trimester. This difference did not reach statistical significance. Our results are consistent with a previous study performed at a regional hospital in the US.[9] Lee et al. discovered that depression prevalence was lowest during the second trimester (18.9%; 95% CI 16.8–21.1%) and highest during the first and third trimesters (22.1%, 95% CI 19.9–24.4 and 21.6%, 95% CI 19.4–28.9%, respectively).[1] However, Moawed et al. reported that antenatal depression was at its lowest rate during the first trimester, at around 7%.[30] In terms of the divergent findings across these studies, ours was the only study that monitored and considered EPDS scores across each trimester; thus, patterns of depression cannot fully be distinguished as of yet. In fact, our present findings suggest that depression could occur at any trimester, and screening during only one trimester is likely insufficient.

4.3. Risk factors for antenatal depression

Factors that were closely linked with antenatal depression included being employed, having a university education, an unintended pregnancy, lack of support from a partner, and having a child cared for by in-laws. Our univariate and multivariate analyses revealed that insufficient emotional support was the strongest predictor of antenatal depression (adjusted OR 3.97, 95% CI 0.16–9.79). Similar findings have been reported elsewhere.[1,4,32] Since the quality of partner support is closely linked to perinatal mental health,[33] women with husbands who welcome the pregnancy and provide support (emotional and financial) help facilitate positive mental health outcomes.

While a variety of risk factors have been revealed in previous studies, employment status and educational level had an inverse effect in the present study. For instance, low educational attainment and unemployment tend to be prevalent among women with antenatal depression, particularly in developed countries.[2] Our disparate findings could be explained by the possibility that pregnant woman may suffer more stress and need to exert extra effort with their job, or their workplace might not include adequate support systems. In terms of our education results, it is possible that highly educated women in our sample were more likely to be employed, which could lead to the difficulties speculated on above.

Marital status was not associated with antenatal depression in our study; however, Moawed et al. observed that marital status, pregnancy status, health complications during previous pregnancies, number of previous abortions, number of stillbirths, and number of children with a low birth weight (less than 2.5 kg) increased antenatal depression risk.[30]

An unintended pregnancy has also been associated with antenatal depression. In fact, an unintended pregnancy has been reported as a highly significant factor associated with depression during the first trimester.[34] This is possibly due to certain women not being able to accept the reality of their pregnancy or feel incapable of taking care of their child.[34] In general, unintended pregnancies place women at a high risk for psychological problems.[34] However, depression intensity, resulting from an unintended pregnancy, usually decreases as the pregnancy progresses.[34]

We also observed that having in-laws take care of a child was associated with antenatal depression prevalence. This effect might be explained via a woman's relationship quality with her mother in-law. The quality

of this relationship tends to be a risk factor for depression during a pregnancy.[33] For instance, Pereira et al. revealed a positive relationship between in-law conflicts and antenatal depression.[2]

4.4. Study limitations

Limitations of the present study should be noted. Firstly, the sample was recruited from mothers attending a single hospital, which included wives of military personnel (vulnerable group). Whether or not our sample was adequately representative of the Saudi maternal population is unknown. Secondly, the interviewing technique used could have led women to give socially desirable responses instead of their true feelings. Thirdly, we determined depression based on a screening tool, and we did not perform a full diagnostic depression assessment. This could have overestimated the depression prevalence we observed. Lastly, women with severe depression may not have volunteered to participate in our study, which may have increased the possibility that we were limited by a selection bias. In response to these limitations, several avenues for future research are possible. For instance, follow-up studies should include consistent screening tools, with a standard cutoff point, which is necessary for cross-study comparisons. Thus, additional studies are needed in order to validate the Arabic version of the EPDS for screening antenatal depression using various cutoff points. Additionally, future studies should include full diagnostic depression assessments when determining actual prevalence rates. Finally, future work needs to probe additional risk factors for antenatal depression in order to highlight the multiple influences and practical intervention strategies.

5. CONCLUSION

Antenatal depression is fairly common during pregnancy. However, early detection of depression during pregnancy is essential for preventing any prolonged symptoms across the antenatal and postpartum periods. We observed an antenatal depression prevalence of 54.5%, with the highest prevalence during the first trimester. Our results suggest that depression screening should be enacted throughout a pregnancy. Furthermore, emotional support from a partner appears to be an important factor to target when assessing antenatal depression interventions.

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